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An Inherited Form of Cortical Cerebellar Atrophy in ("Daft") Lambs* in Great Britain

By

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Introduction

White & Rowlands (1945) recorded the occurrence in pedigree Welsh lambs of an "hereditary defect" of lambs associated with locomotor disability. They dealt with the history of the flock and emphasised the resemblance of the "ataxia" to that of swayback (a demyelinating disease of lambs associated with a "conditioned copper deficiency"—see review of Innes (1943)). This paper narrates further clinical observations, and briefly pathological studies which were made on these and other "daft" lambs.

The need for more intensive work in animal neuropathology has been stressed before, not only because of its veterinary importance but also because such studies might help clarify medical problems. A closer approach to the techniques adopted by the medical neurologist and neuropathologist is, however, necessary. One result of this neglect has been that there is a big contrast between the amount of study given to (*a*) the comparative anatomy, physiology and histology (using the monkey, cat, dog and rat as type animals), as opposed to (*b*) the comparative neuropathology of domesticated animals. Consequently there must be many fatal, and non-fatal, diseases of animals (excluding the neurotropic virus diseases) which may not have been identified at all (even those showing nervous manifestations during life), may have been confused clinically with others, or may have remained unexplained on a pathological basis. This cerebellar atrophy of lambs is illustrative in this direction, because it almost certainly has existed for many years.

Swayback is a form of paralysis (which once was frequently seen in new-born and young lambs) the pathology of which includes cerebral demyelination and degeneration of the motor tracts. After this became known, no doubt any form of "paralysis" of young lambs, especially when cases occurred in batches in the same flock, might have been confused with swayback because in diagnosis of sheep diseases more attention is paid to flock history than to careful neurological examination of individual animals. During pathological work over many years, the records of one of us (J. R. M. I.) include: (1) three cases of purulent osteomyelitis of a thoracic vertebra with extension to the cord, (2) a peculiar bilateral myopathy of the hind limbs and (3) one other peculiar case of cerebellar atrophy which is mentioned later. In each of these three instances the lambs had been "paralysed" and all were sent as cases of swayback. Another of us (W. T. R.) found that staphylococcal pyaemia following tick-bites with localisation of infection in the cord causing a "motor paralysis" of the hind limbs was frequently regarded clinically as swayback in the Welsh hills. There is, however, much more to a neurological picture than this one symptom of "ataxia," and some attention might be given with profit to this in terms of disordered physiology. This is important because, since prophylactic copper therapy has been used against swayback, there have been reports of its inefficacy; in such events pathological diagnosis should be made in each case by examination of the nervous system.

This "daft lamb" condition is not confined to the pedigree Welsh breed; cases were received from Scotland, Yorkshire and Northumberland. In view of its possible clinical confusion with other diseases, it may even be more widespread and it will increase unless steps are taken to sift the probable genetical complexities. A similar disease may have occurred in a flock of Corriedale sheep in Canada (Rasmussen, 1945).

This paper is published in its present form to stimulate the interest of practitioners and investigation officers in sheep-rearing areas so that more data may be obtained on its prevalence and genetical background; the facts given should be sufficient to enable its recognition.

Field Investigations

(*a*) GENERAL HISTORY AND INCIDENCE

The disease was first observed by one of us (W. T. R.) in North Wales in 1944. Cases (now known to be identical) were received by another of us (J. R. M. I.)—(1) from Mr. H. E. Harbour (Veterinary Investigation Officer, Edinburgh) in 1944, from a flock in south-east Scotland; (2) from Mr. P. L. Shanks (Veterinary Investigation Officer, Leeds) in 1945, from Yorkshire and (3) from Mr. W. Lyle Stewart (Veterinary Investigation Officer, Newcastle) in 1946, from the border counties. Our cases, therefore, are derived from four widely separated regions: Scotland (one), North Wales (eight), Northumberland (four), and Yorkshire (two). In addition, a peculiar case with some analogy was identified and slides and records kept by one of us (J. R. M. I.) from Radnorshire during swayback investigations in 1935.

Since a fairly complete history of the flock is available for the North Wales cases, although recorded by White & Rowlands (1945), it is important to summarise this here. The flock consisted of about 60 pedigree Welsh ewes and rams managed, together with a closely related (on male side) flock of 600 Welsh mountain ewes, by the same shepherd for 30 years. The College Farm consists of lowland, hill and mountain grazing; the lowland is farmed intensively and has many improved pastures; the pedigree flock for most of each year is kept here where its main purpose is to provide good rams for the mountain flock. There was no known deficiency of minerals, or of trace elements, in this area.

The first few affected lambs were regarded as poor lambs, but as more cases occurred, more attention was given them, and after eliminating the possibility of swayback some consideration was given to the breeding aspect. Two rams had been used in the flock in 1943 and only the progeny of one ram apparently was affected; the inherited nature was thus suspect. Further observations suggested that the disease was attributable to the introduction in 1940 of a particular ram (No. 1). His performance was such that he had been retained in the flock for three years, and by 1943 many of the mated ewes were his daughters. Two rams were used that season—Ram No. 2 distantly related to Ram No. 1, and Ram No. 3 a son of Ram No. 1. The following was the result of the mating:—

Ram No. 2 × 13 ewes (nine daughters of Ram No. 1)—no defective lambs.

Ram No. 3 × 32 ewes (23 daughters of Ram No. 1 and half-sisters of Ram No. 3)—nine defective lambs. No defective lambs from mated unrelated ewes.

Quite often a ewe carrying twins gave birth to a normal and a defective lamb but in others both of the twins were defective.

It is clear that sons of Ram No. 1 would be used in the mountain flock in 1942, 1943, 1944 and 1945 and that a proportion might produce defective lambs if mated with daughters of any such rams, and, in fact, four such cases occurred in the flock in 1945.

A small experimental breeding scheme was arranged in 1944 and Ram No. 3 was mated to eight ewes of which six were daughters and two were half-sisters, but unfortunately, two were barren and the remainder threw normal lambs; the limits of expectation were obviously too low. In 1945, twelve ewes, again daughters, were mated with Ram No. 3 and four affected cases (one set of twins) were born. In the main mountain flock, despite arrangements aimed at avoiding the condition, a few cases occurred.

No such detailed history is available of the cases from Scotland, Yorkshire or Northumberland. Harbour, in a letter, mentioned (*a*) that the condition was apparently confined to tup lambs of the Border Leicester and its crosses, (*b*) that it ran in certain families, (*c*) that its incidence was not high and (*d*) that in 1944, at least, swayback did not occur in the same flocks.

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* These cases were collected while two of us (J. R. M. I. and H. B. P.) were working in the Veterinary Research Laboratories, Imperial Chemical Industries, Wilmslow; since then further histological study has been made with the invaluable help of Dr. Ludo van Bogaert, Institut Bunge, Antwerp, Belgium; a paper dealing with the neuropathology in more detail will appear elsewhere.

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(*b*) Clinical Findings

Ewes. The mothers were normal, with normal pregnancy and with no dystocia, although the observations were limited largely to first pregnancy ewes. Affected lambs (Welsh cases) were mainly single (multiple pregnancies are not, however, very frequent in these sheep). The subsequent incidence, from successive pregnancies, is unknown; a further communication may be made on a follow-up of this problem.

Lambs. The following is a brief general description although individual cases have shown much variation in severity of the nervous dysfunction; for convenience the cases are grouped into (1) lambs which were able to walk, but showed gross inco-ordination, and (2) lambs which were born unable to stand or walk.

(1) Able to walk, but with great difficulty; tendency to straddle forelegs in order to achieve equilibrium; occasionally walk around in circles, or take a few steps backwards and then sit down; act of rising, *i.e.*, hind legs first, performed with great difficulty. One characteristic is a wandering tendency, the lamb constantly on the move. Able to cry but thin and weak. Inclination of head to one side as if listening acutely. Vision might be defective. Equilibration difficulty seen when lamb placed on low table, as it fell off when reaching the edge instead of stepping off. No flaccid paresis. Able to suck vigorously from bottle and would follow bottle if held near nose. Defaecation and urination frequent in normal position. Opisthotonos—head occasionally arched back with some neck rigidity. Some coarse tremors. Tail wagged normally when sucking from bottle. Normal movements of eyes; no nystagmus. Normal corneal and pupillary reflex. Excessive noise (rattling of tins) did not disturb the lamb.

(2) Animal lay on its side, aware of surroundings. Head posture normal for lying. Defaecation and urination normal. Deviation of head to the right when lifted which disappeared when lying on the other side. Head and neck righting reflexes normal (horizontal, left, right, lateral and inverted). Eyes:—CR positive; PR positive but pupils unequal—being smaller on the right; EPR negative on both sides or only very faintly positive; fundus normal. Jaws and tongue normal. When held by the body the head and neck showed coarse tremors (about 3 per second). Limbs could be moved voluntarily and in some co-ordinated manner as if trying to gain feet but unable to place feet beneath body. Some spasticity of the limbs especially on that side on which it was lying. Forelimbs—increased response to digital pressure; crossed extension reflex normal to pricking or compression of feet. Forelimb reflexes were normal, hindlimbs similar but patellar reflex exaggerated and response to pricking less marked; hindlimbs extremely weak and no attempt made to take weight upon them. On being lifted to feet there was spasticity of the forelimbs with no extension of *pes* so that animal tried to stand on its toes. Moved tail, sucked vigorously and swallowed.

Pathological Investigations

(*a*) *Material and Methods.*—Fifteen cases were examined pathologically, eight of which were seen alive by J. R. M. I. and H. B. P.: these were artificially fed and died, or were killed, after periods of a few days up to a month after birth. Only the carcase was obtained of four cases and in the remaining three examination was limited to the brain and cord which was sent in fixative. A thorough autopsy was carried out, on the available cases, in the usual manner, particular attention being paid to the brain, cord, nerves and muscles. All tissues were fixed in 10 per cent. neutral formol-saline. In a few cases sections were made from all the visceral organs. In all cases the brain and cord was fixed in 10 per cent. neutral formol-saline before slicing except in a few instances when small representative portions of the CNS were fixed in alcohol or formol-ammonium-bromide for special techniques. Sections were prepared after paraffin and celloidin embedding and by frozen methods and were stained by routine survey stains and by specialised neuropathological methods. For control work many normal brains of foetal and young lambs (part of the pathological collection of J. R. M. I.) were available in addition to a few sections of cerebellum from normal foetal lambs, all of definite known ages, presented by Dr. G. Romanes, Anatomy Department, University of Edinburgh.

(*b*) *Anatomical Findings.*—There were no lesions in the viscera of any case with the exception of those which died (in one of these there was a large lung abscess, in others a purulent lobar pneumonia). There were no lesions associated with the umbilicus or joints. Apart from a moderate degree of inanition there were no lesions present in the muscles and certainly none characteristic of a myopathy (including a peculiar form which Innes & Parry (1947) have identified). The brain, cord and peripheral nerves were normal; there was no inflammation of the meninges, no extra-cerebral haemorrhage (birth injury) and no excess cerebrospinal fluid. The cerebrum, cerebellum and other parts appeared to be fully developed for young lambs of their respective age groups and there was no recognisable reduction in the size of the cerebellum. After slicing the brains coronally the white and grey matter was clearly demarcated; there were no haemorrhages or areas of softening and the ventricular system was normal.

(*c*) *Histological Findings.*—There were no lesions in the visceral organs apart from those associated with a terminal illness, *e.g.*, lung abscess or pneumonia. Many negative neuropathological items can be mentioned now as this helps to dispose of some aetiological possibilities, *e.g.*, swayback, bacterial or virus infection, trauma or birth injuries. There were no significant (1) inflammatory cell infiltrations (focal or peri-vascular), (2) foci of demyelination, (3) haemorrhages, (4) vascular or meningeal changes, (5) excess meningeal pigment deposition, (6) changes in the ventricular system or choroid plexuses, (7) neuronal changes in the motor area, basal ganglia or red nucleus, (8) lesions in a number of pieces of muscle from both fore- and hind-limbs.

In 13 out of the 15* cases lesions were present in the cerebellum but before dealing with these certain features of the normal cerebellar cortex in the lamb might be considered. In the new-born lamb sections of the cerebellar cortex reveal almost the fully developed structures of a superficial molecular layer, a uniformly differentiated Purkinje cell layer and a subjacent granular layer (Figs. 4 and 6). Occasionally in some folia there may appear gaps in the Purkinje layer but the cells are, on the whole, evenly spaced out from each other by perhaps the length of the diameter of a cell. In new-born lambs there is constantly present an extra-subpial granular layer (remnants of superficial cortex) which thins out and disappears in a few weeks.

There was some reduction in volume of the individual cerebellar folia (Figs. 5 and 7), otherwise the normal differential lamellar arrangement of molecular and granular layers and white matter was well preserved compared with the appearances of normal foetal brains (late stage) and of lambs one day to four weeks. There was certainly no suggestion of a gross degeneration (visible macroscopically) such as was observed in the cerebellar

* Two of the 15 cases (Northumberland) showed *no cerebellar* lesions; one was a freak lamb with scoliosis, absence of tail and some peculiar angiomatous malformation of the brain; the other showed peculiar lesions of the anterior horn cells. They were not seen alive by us and only the brain was sent; they probably were presented by the farmer as suspected "paralysed daft" lambs and emphasised what has been said before about correlating clinical and pathological data.

Legends to Figures

Figs. 1 to 3.—"Daft lambs." Enlargements of a few frames taken from a 16 mm. ciné film demonstrating some of the symptoms of a case which was able to walk with difficulty. Fig. 1 illustrates the straddled, broad based, abnormal attitude and difficulty of equilibrium. Fig. 2: the lamb is in the process of toppling over when trying to turn. Fig. 3 exhibits clearly the degree of opisthotonus sometimes seen. (Case 33/47, Northumberland.)

Fig. 4.—*Cerebellum normal,* one-day-old lamb. Vertical section through summit of folia, paramedian lobule. (*a*) Extra subpial granular layer, (*b*) molecular layer, (*c*) Purkinje cell layer, (*d*) granular layer. Celloidin. Nissl. (46/47.) × about 110.

Fig. 5.—*Cerebellum, Daft Lamb.* Section through summit of folia; compare with Fig 4, reduction in volume of the layers, paucity of Purkinje cells which are difficult to find at this power, increased cellularity of proliferated Bergman's layer. Nissl. (Case 44/47.) × about 110.

Fig. 6.—*Cerebellum, normal,* one-day-old lamb. Vertico-transverse section to be compared with Fig. 7. Nissl. (46/47.) × 110.

Fig. 7.—*Cerebellum, Daft Lamb.* Same case as Fig. 5. Vertico-transverse section showing features as in Fig. 5. Nissl. × 110.

Fig. 8.—*Cerebellum, Daft Lamb.* Same case as Figs. 5 and 7. Shows some preservation of Purkinje cells, empty fibrillary baskets, persistence of parallel fibres and torpedo formation on some of the axones. Bielschowsky. × about 150.

Fig. 9.—*Cerebellum, normal lamb.* Vertico-transverse section passing through caudal part and showing some features of macroscopic anatomy. (The only reference in this direction is the short student's guide by Wilkie (1947).) Some of the essential recognisable divisions are labelled: M = medulla. O = olives. P.M.L. = post. median lobule. L.S. = lobule simplex. P = paraflocculus. T = tuber vermis. ×4.

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CORTICAL CEREBELLAR ATROPHY IN LAMBS

FIG. 1.

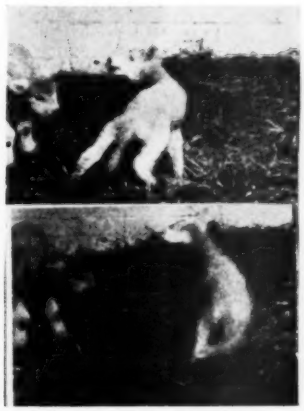

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

CORTICAL CEREBELLAR ATROPHY IN LAMBS

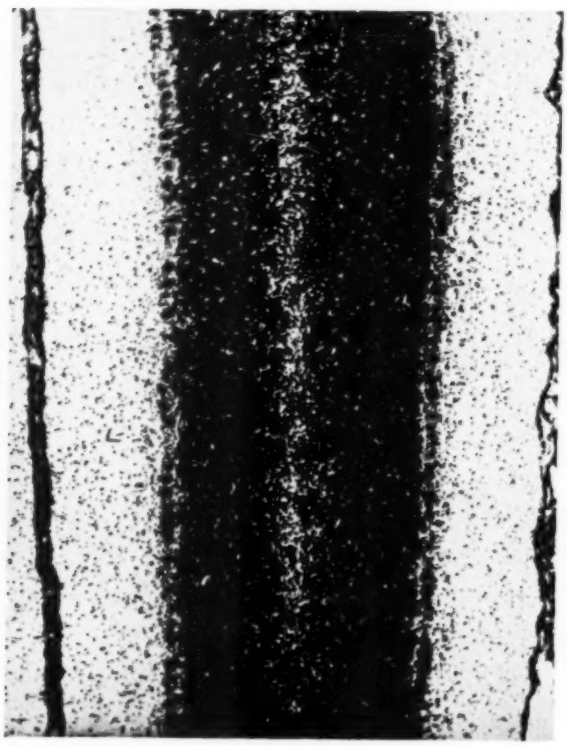

FIG. 6.

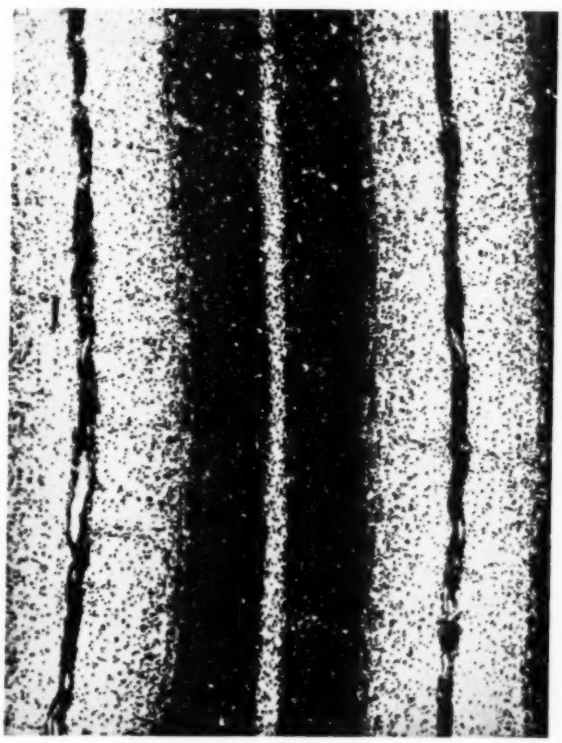

FIG. 7.

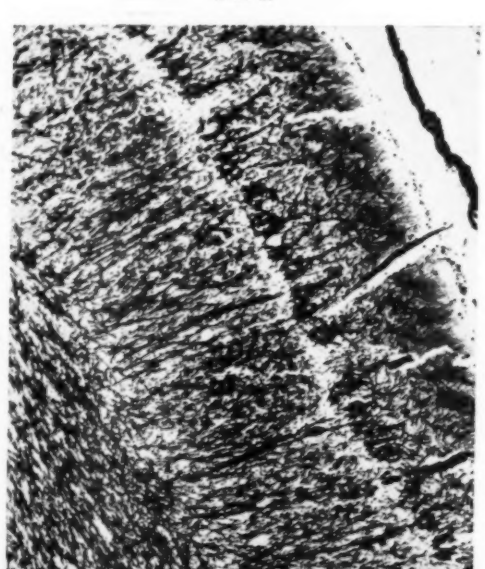

FIG. 8

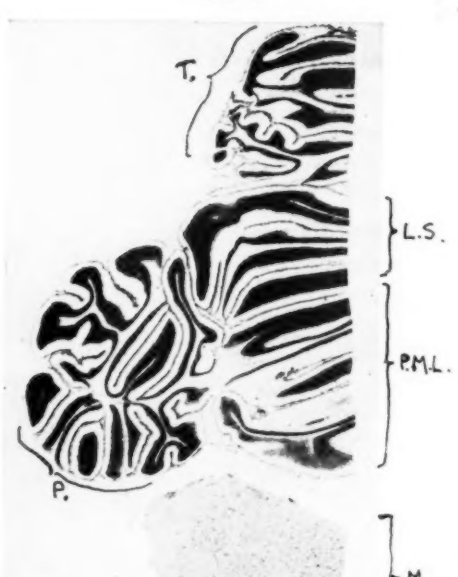

FIG. 9

disease of Hereford calves* (Innes, Russell & Wilsdon (1940)) and in other animals such as the cat to which reference was made in this latter paper (See also Schut, 1946).

There was considerable variation in the tempo of the structural alterations which are described below in different cases and in different parts of the cerebellum of the same case. They were for the most part more noticeable in the paramedian lobule, the flocculus and posterior median lobule than in the ansiform lobule and the tuber vermis, but this quantitative difference is of little importance here. For the purpose of this paper the changes can be regarded as uniform and qualitatively precise and have not been seen in the cerebellum of lambs suffering from any other form of nervous "dysfunction." The cerebellar nuclei were intact. The changes affected the Purkinje cells and to a lesser degree the cells of Golgi (Type II). A relative paucity of Purkinje cells was distinguishable under the low magnification (Figs. 5 and 7) and might be quite severe in some folia. The earliest change consisted of a ballooning of the Purkinje cells, the cytoplasm staining bright pink with eosin and with crenation of the borders of the cells; some showed a foamy appearance due to the presence of lipoid demonstrated by fat stains. Extreme severity of cellular degeneration took the form of greatly tabescent neurones (Purkinje and Golgi cells), some lying in retraction spaces, and compressed chromatin remains of what might have been the nucleus were present at the edges of these degenerated forms. Occasionally there was a tendency for "a falling out" from the sections. The confluence of these lesions thus gave the layer of Purkinje cells a reticulated or fenestrated appearance. In silver preparations the sites of the degenerated Purkinje cells were represented by empty fibrillary baskets and some of the axones showed "torpedo" formation. (Fig. 8.) There was an accompanying proliferation of Bergman's glial layer and gliosis. Other changes of neuropathological importance will be dealt with in more detail elsewhere.

Discussion

From the history alone this condition can probably be placed in the category of inherited diseases of the nervous system. The cerebellar lesions are essentially responsible for the locomotor trouble seen at birth (although we are uncertain, at the moment, as to whether there was any disturbance in the vestibular apparatus or visual pathways). The syndrome thus falls into line, in some ways at least, with observations which have been made on cerebellar atrophies in man and in other animals, *e.g.*, cats, dogs and Hereford calves; reference can be made to the articles by Brouwer (1934), Innes, Russell & Wilsdon (1940), Schut (1946) and to the valuable monograph of Scherer (1944). The familial tendency in man is well known although the time of onset is at a much later period of life. In the fascinating book by Grüneberg (1947) on "Animal Genetics in Medicine" attention is drawn to the fact that we should not be misled into believing that the influence of heredity is exercised mainly during more dramatic phases of early development. The fact that in this lamb condition the animals are born affected may not be of exceptional moment if some reflection is given to certain aspects of structure and development.

In consideration of the pathology of the brain of any animal compared with man differences of reaction and time of onset may appear as a result of variations in anatomical structure, precocious embryological development and even of phylogenetic influences. There is little available information on the detailed anatomy and development of the sheep brain, but the following facts may be of importance. The brain weight of the newly born lamb is about 80 grammes (compared with that of the human babe of about 385 grammes), while in the adult sheep the brain weighs about 95 grammes (human adult about 1,400 grammes) so relatively little post-natal CNS growth occurs in the sheep. A private communication from Dr. George Romanes† intimates that "cerebral myelination in the sheep seems to be almost fully developed at birth and that of the cerebellum fairly early, *viz.*, in the uncinate fasciculus, dorso-spino-cerebellar tract, medullated fibres in cortex of vermis at 66 days; the ventral spino-cerebellar tract and *brachium conjunctiva* at 78 days; the myelin in cortex of lateral lobes and *brachium conjunctiva* at 78 days; the myelin in cortex of lateral lobes and *brachium pontis* at 96 days. From this it must appear that the spatial arrangement of the Purkinje cells is well established by halt term, that is, 60 to 70 days, and probably much earlier, the formation of myelin being one of the last stages in the maturation of the neurone which functions long before acquisition of its myelin sheath." Barcroft showed that the sheep embryo as early as the 36th day will display mass movements on touching the nose with a glass rod, which emphasises clearly this precocious development of the nervous system of the lamb. (Harris (1937) states that this throws considerable doubt on the view that myelination of tracts determines the onset of function therein.) As we all know, the lamb rises within a matter of seconds after birth and is fully capable of performing most motor functions, which in itself is a corollary to the above statements. Examination of a limited number of sections of the cerebellum of foetal lambs of known ages (74, 102, 120, 129 and 140 days), indicates that the cellular migration is well forward by 100 days and that the Purkinje cells at that stage show signs of full differentiation; the question of the temporal order of development, especially *re* cellular migration, may be of the utmost importance, in explanation of the formal genesis of the disease.

Clinically, at least, "daft" lambs resemble a condition described by Rasmussen (1945) occurring in four inbred lines of Corriedale sheep in Canada (he mentions the occurrence of something similar in Iceland). It was first seen in 1942; from the meagre clinical data given it could be placed side by side with "daft" lambs: they were mostly unable to stand—if this was possible they stood with straddled legs on a broad base; there was obvious incoordination, tremors and a degree of opisthotonus apparent from the photographs of the lambs. Death occurred usually within 48 hours through starvation. The defect was said to be conditioned by a recessive gene although perhaps not a simple case of a homozygous recessive condition. There was, unfortunately, no pathological examination although it would be of great importance to establish its nature. (This is a frequent happening in the field of heredo-pathology because as Grüneberg indicates many inherited diseases are studied by geneticists without a pathological background or by pathologists without a genetic one.) In a private communication Rasmussen has informed one of us (J. R. M. I.) that in 1945, 1946 and 1947 in the special breeding arrangement, 18 further cases had occurred but all animals known to produce affected progeny were then eliminated from the flock. The condition described by Fraser Roberts (1929) as a lethal muscle contracture in lambs is obviously not the same, the lesions being essentially widespread muscular dystrophy and fibrosis. There is no record of any similar cerebellar condition in lambs in the check-list of lethal and sub-lethal characters in farm animals prepared by Lerner (1944) nor in the article by Hutt (1946).

The disease in lambs is another example of an heredo-pathological type which deserves study, but the most immediate practical problem is one which affects the sheep breeder. The condition merits close attention by the geneticist in order that the causal mechanism can be solved. Unfortunately enquiries which are necessary in this direction often receive little sympathy from the professional breeder who, through shortsightedness in protecting his own immediate interests, may not allow facts to be known. This was seen when enquiries were made regarding the incidence and genetical background of the bulls responsible for producing cerebellar atrophy in Hereford calves; these were fruitless and no doubt the progeny of such bulls still are producing affected animals although little, or no, information of this nature reaches interested scientific workers.

There is no need to dwell here on a discussion of the pathological aspects. The description has been narrowed to sufficient details which will enable subsequent identification of the disease by others. An analysis of the specific lesion, its distribution and development, and its relationship to the cerebellar atrophies of man and other animals will be published elsewhere.

The functions of the cerebellum are to assist in the maintenance of tone of body musculature, to maintain the steadiness of that tone and to increase the energy of muscular movements. A diseased cerebellum, therefore, might produce symptoms such as muscular weakness, abnormal postural attitudes, tremors, disorders of gait (in severe cases the difficulties of standing and walking are enormous) and difficulties of equilibration. Equilibrium may be obtained by the standing on a wide base but with swaying and tottering and ultimate falling in any direction. Nystagmus apparently is not so commonly seen in animals as probably the vestibular nuclei have to be involved. All these ataxic manifestations can be resolved into terms of faulty antagonism of muscle groups and

* A similar condition in a lamb was identified before by one of us (J. R. M. I.) in 1935. This lamb was sent in by Mr. N. Bissett, then Veterinary Investigation Officer, Cardiff, during the investigations on swayback. It was sent in as a typical case of swayback from a farm in Radnorshire on which it was said that 12 cases of "paralysis" had occurred following the purchase of a particular ram in 1934! There was no previous history of swayback on this farm and there were no lesions of swayback found in this particular lamb. The cerebellum showed a marked aplasia of the cortex, of the molecular and granular layers, and a great paucity of Purkinje cells; surviving neurons showed all stages of degeneration described for "daft" lambs, but to an extreme degree and with a very marked gliosis.

† Anatomy Department, University of Edinburgh. This worker has had an extensive experience of examination of foetal lamb material from the nervous system, obtained during the course of the well-known investigations of the late Sir J. Barcroft, F.R.S., Cambridge.

were illustrated in these lambs. The absence of any other associated malformations, the quality of the cellular changes, the marked glial reaction and absence of inflammatory reaction, all support the idea that the condition is a precocious form of atrophy of the cerebellar cortex, and is not a congenital hypoplasia or an encephalopathy with a predilection for the cerebellum.

When diseases of this nature occur in the field,* as the animals are unable to fend for themselves, they are usually killed or die rapidly from malnutrition and exposure. If sufficient care is taken, however, "daft" lambs (and also cases of swayback and Hereford calf disease) can be kept alive by artificial feeding for quite a time. One lamb in the present series was kept alive for about a month; the lesions in the cerebellum of this animal showed little, if any, difference in severity from those examined at birth. This might indicate that in this defect maximum damage has already occurred by birth and that the disease is not really a progressive one.

Summary

1. An "inherited" disease of lambs known locally, in some parts, as "daft" (or "mad") lambs has been identified in a pedigree flock in North Wales; it also has occurred in South Wales, S.E. Scotland, Northumberland and Yorkshire. The disease thus probably affects a number of breeds in quite different geological regions. (It may also have occurred in Canada.)

2. The "paralytic" syndrome, which is seen at birth, has as its pathological basis a form of cortical cerebellar atrophy which has a parallel in other animals and perhaps in man.

3. The symptoms of "ataxia" may be confused with swayback and other conditions.

4. The condition deserves a thorough and complete genetical investigation from the practical point of view of the breeder, but further studies would also be of value from the point of view of heredo-pathology.

Acknowledgments.—Generous acknowledgment is made by one of us (J. R. M. I.) to the valuable help received in the interpretation of the lesions from Dr. Ludo van Bogaert, Institut Bunge, Antwerp, and for the preparation of the microphotographs (4 to 9) to illustrate the lesions. A separate detailed paper is being presented elsewhere by Bogaert and Innes. Most of the manuscript was written in the first place while one of us (J. R. M. I.) held a temporary grant from the Animal Health Trust, London, to whom thanks are due.

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* From the point of view of studies in genetics and heredopathology it would seem there is scope for the establishment of some institute which would serve as a central pool for the continuation of inbreeding of animals with inherited diseases. In many cases subsequent to the identification of a genetical defect in animals steps are taken to prevent its recurrence and the breeding strain may be lost.

At the annual general meeting of The Institute of Meat, Mr. W. T. Baker, J.P., was elected President for the ensuing year, and Mr. E. Smith Vice-president.

Fog Fever*

By

V. J. S. LESLIE, M.R.C.V.S.

Skipton, Yorks

Fog fever is a condition which has been recognised in my practice for the last four or five years. It is similar to, but must not be confused with, pneumonia of the dairy cow. Begg[1] has recorded the clinical findings associated with the disease and it is evident that the cases encountered in the Craven district are identical with his.

The appearance of the disease is limited to the months of September, October and November. The condition is found especially in animals which have recently calved or are about to calve. Youngsters are not affected, as may be instanced by the herd in which six Galloway cows were attacked this year, but the calves suckling them remained healthy.

Fog fever, as the name suggests, is associated with grazing on fog or aftermath. The milk yield and the appetite are not seriously affected, but when the appetite fails it is a bad sign. The disease apparently is not limited to this country for Udall has described cases in U.S.A. He does not suggest a cause apart from a possible association with Pasteurella infection.

Fog fever occurs on all farms and in all situations in the practice and apart from the presence of fog there, the outbreaks appear to have nothing in common. The farmers are inclined to blame artificials and reseeding, but the condition has been met on farms on the margin of cultivation in the Dales. Begg suggests that the supposed allergy may be associated with the consumption of spiders' webs from the myriads of spiders which are hatched at this time of year, and which cover the aftermath with gossamer. However, a considerable number of cases have arisen in wet, cold windy weather when one would imagine the spiders would keep out of the way and when the webs would tend to be removed mechanically by the wind.

One wonders if the "fog cough" of autumn is related to this condition. There seems to be a tendency for cattle to cough at this time of the year and the older farmers indicate that this has always been the case. The farmers believe it is "the protein of the grass which has gone to the lungs" but a more satisfactory explanation with adequate treatment is anxiously awaited.

Mortality

This year (1948) between 40 and 50 cases have been seen and approximately one-third of the affected animals have died.

Symptoms

Begg[1] emphasises the sudden and alarming appearance of symptoms and this has been a feature of my cases. On one farm a cow was brought in for evening milking and it was noticed that her breathing was hurried. Although the owner 'phoned promptly the three-quarters of an hour which elapsed before I arrived was sufficiently long for the symptoms to have worsened progressively to a degree where the animal was in distress. Breathing was both quickened and deepened and the expiratory grunt, which I consider so typical of the disease, was present. This case ended fatally. The temperature of cows affected with fog fever is usually normal or very slightly raised in the first stages (102° or 102·5° F.). Occasionally a temperature as high as 106° F. is found but this is thought to be a result of secondary infection of the lungs. In short, if a cow is found which has most of the signs of pneumonia but has a low temperature and grunts with each expiration, then the case is probably one of fog fever. A genuine cough, as opposed to pneumonia, is usually absent, but after the animal is excited as in drenching, a cough may be noted. After one case has appeared in a herd another two or three animals often develop the same symptoms to varying degrees. Clinical examination of such animals shows that changes are limited to the chest and auscultation reveals lungs which crepitate so loudly that the sounds of the heart may be obliterated. While the condition has been ascribed to allergy and the pathology is that of a primary oedema of the lungs, it is noteworthy that even in the earliest cases examined the chest has seemed more resonant than usual with no sign of solidity. After two or three days subcutaneous emphysema commonly develops and when the air is prominent under the skin of the withers and neck a fatal outcome is expected. If the cow lives it may take two or three months before the air is reabsorbed. The stomach is not upset in this disease, except in so far as pressure on the oesophagus interferes with normal action.

* Contributed to the Yorkshire Division, N.V.M.A., "Clinical Discussion" at Leeds, October 29th, 1948.

Post-mortem Examination

Post-mortem examination of affected animals presents a characteristic appearance in the chest. The lungs are only slightly congested but there is prominent emphysema. The lungs are so enlarged as completely to fill the thoracic cavity and underneath the pulmonary pleura the emphysema forms multiple cavities which vary from small bubbles to the size of golf balls and larger. The air even extends subcutaneously over the whole of the back and internally it may lift the parietal peritoneum so as to include the kidneys in large bubbles and then extend posteriorly to the pelvis. Specimens of lungs examined by the Ministry's laboratory have been reported as free from salmonella and pasteurella infection.

Treatment

Treatment can only be described as unsatisfactory. Natural recovery takes place and the speed of recovery does not seem to be materially affected by medicaments. Prognosis is always doubtful for some of the worst cases have shown recovery in a week or ten days and one particularly ill animal with very rapid breathing was almost normal in two days. On the other hand, some of the relatively mild cases have ended fatally. On account of the suggestion of allergy, adrenalin in 10 c.c. doses has been given to early cases without material benefit. "Anthisan" similarly has proved useless. Over the last four or five years with a number of cases occurring each year a variety of drugs have been tried empirically. Sulphapyridine has provided no improvement and last year (1947) sulphamezathine in adequate doses proved unsatisfactory. This year a mixture of oil of camphor, oil of eucalyptus and creosote has been given in medicinal doses and a slight improvement is believed to have been noticed. This has been put down to the effect of the medicine in supporting the heart's action. When recovery occurs it is complete—the emphysema disappears completely, as do the associated symptoms of broken windedness—and there seems to be no tendency for repeated attacks. Only one of last year's cases has had a similar attack this year.

Reference.—(1) Begg, H. (Jnr.) & Whiteford, W. A. (1948.) "Acute Interstitial Pulmonary Emphysema of Bovines." *Vet. Rec* **60**, 135.

Discussion

Mr. R. I. Wood, Ripon: In his experience of this disease a cough had been noted together with profuse salivation. His cases where subcutaneous emphysema had developed over the chest had not proved fatal but had largely recovered in 48 hours. The condition had never arisen, as far as he knew, in animals on new leys, but had been associated with "fog" on old pasture. His treatment, similarly, had been to provide heart stimulants.

Mr. K. G. Towers pointed out the possibility of hoose infestation arising from fog where the larvae survived the hay crop, because they did not climb the herbage, while the moist conditions also favoured their survival. He asked what time-relationship existed between animals being put on to fog and developing the disease.

Mr. Leslie, in reply, said the "incubation period" after the animals were put on to fog varied tremendously. While in some cases symptoms had been seen after a few days grazing, in others the animals had been on the pasture since the hay crop had been taken in July or even wintered and summered on the same pasture.

Mr. H. B. Allan asked if this disease was that called "fog ill," which occurred in other parts of the country and where the *post-mortem* findings of prominent interlobular septa simulated those of contagious bovine pleuropneumonia. Cases had even been reported as this scheduled disease although individual animals of groups had been affected.

Mr. Lofthouse, Otley, said he had found a good deal of the disease around his practice in Wharfedale. In most cases a sharp cough rather like that of hoose had been heard and as well as expiratory grunts he noted moaning respirations which resembled those of pleurisy. Some would settle down when left alone but others grunted continuously. Fewer deaths were experienced this year—out of 30 to 40 cases, only two had died; this was better than had been found previously. His findings at *post-mortem* examination and the temperatures of the cows were the same as Mr. Leslie's. He suggested 10 per cent. of his cases had shown subcutaneous emphysema but none of these had died. He had in his possession a book on animal diseases printed in 1820 by a chemist who practised in Skipton and Otley. This writer described the condition in a most thorough manner, so that there was no doubt that the disease had existed in that locality for some time.

It has been proposed that representatives of all of the producers and dealers in biologicals, drugs and drug specialities intended for use in the treatment of animals, should meet with representatives of the American Veterinary Medical Association, of the Bureau of Animal Industry and of the Food and Drug Administration to agree upon a list of such agents as should never be sold directly to laymen.—*Vet. Med.*

CLINICAL COMMUNICATION

Dislocation of the Corono-Pedal Joint in the Horse

By

K. C. PETERS, M.R.C.V.S.

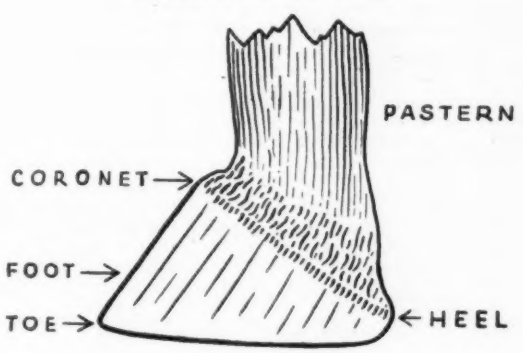
Stratford-St.-Mary, Suffolk

Subject.—Riding gelding, four years, 15 hands.

History.—The horse had stampeded from its paddock during the night and was found in the morning to be acutely lame on the off fore leg.

Symptoms.—The off fore foot was held off the ground. It was noted immediately that the foot was bent upwards so that the angle between the pastern and the coronary band was abnormal. Assuming, for the purpose of description, the coronary band to be horizontal, the pastern, instead of pointing slightly backwards and upwards, was directed forwards and upwards so that the front surface of the second phalanx appeared almost in apposition to the coronary band. The foot and pastern were firmly fixed in this position. (See diagram.)

Diagram of Foot and Pastern



On manipulation there was great pain. There was very little movement except slight rotation of the foot about the long axis of the pastern, this rotation being accompanied by a faint impression of scraping: no crepitus was audible. There was slight swelling at the back of the foot between the lateral cartilages.

Diagnosis.—Dislocation of the corono-pedal (second interphalangeal) joint with backward displacement of the lower articular head of the second phalanx (os coronae) with probable damage to the ligamentous tissue involved in the joint.

Treatment.—(1) *Anaesthesia.*—A bilateral high plantar nerve block was performed.

(2) *Reduction.*—The horse's knee was flexed and the operator's knee placed against the back of the fetlock. The toe of the hoof was grasped with both hands and pulled very forcibly upwards against the pressure of the operator's knee. There was a loud click. The foot was now seen to be in the normal position and freely movable. There was no crepitus and manipulation showed nothing abnormal.

After-Treatment.—A Patten shoe was immediately fitted, the heel of which was raised 2½ in. from the ground. After three weeks a 1 : 8 biniodide blister was applied between the heels at the back of the pastern. This unconventional procedure appeared to have no adverse effect. Six weeks after the accident the shoe was removed and the horse turned out.

Subsequent History.—The horse was walking sound in one month after turning out and was trotting sound in three months from that time. A year later it became permanently lame in the same foot and was destroyed. Unfortunately it was impossible to make a *post-mortem* examination.

Remarks.—I would be interested to hear of any similar cases. To the best of my knowledge this condition has been reported only once, in German literature, but was seen *post mortem* on that occasion.

ABSTRACTS

[Panting in Cattle: A Sequel to Foot-and-Mouth Disease. I—Experimental Observations and Pathology. MINETT, F. C. **II—Biochemical Observations.** MULLICK, D. N. (1949.) *Amer. J. vet. Res.* **10.** 40 and 49.]

I. A proportion of cattle that had suffered from foot-and-mouth disease became "panters," the condition representing a more or less permanent failure of the heat-regulating mechanism of the body, in consequence of which dyspnoea was one of the most prominent symptoms. Clinical and pathological observations were made on 23 panters, the severity of the complaint varying from one individual to another. Symptoms were usually worse in the monsoon than in the hot-dry season, and notwithstanding a respiration rate of over 100 per minute the body temperature of a bad panter during the heat of a monsoon day might be as high as 103° F. The 23 panters were examined *post-mortem*, particular attention being paid to certain of the endocrine glands: changes were found chiefly in the thyroids which showed a marked reduction in size. Histologically the glands showed diminished storage of colloid, and very small thyroid vesicles. It is suggested that (1) the thyroid is too active for the animal's needs, its reduction in size and function representing an attempt at adaptation, and (2) the panting condition is due to a chronic anaemia and interference with the normal working of the pituitary-thyroid-adrenal mechanism: an explanatory hypothesis is presented.

II. During a period of four years biochemical studies were made on groups of normal control cattle and panters. The significance of the various findings is discussed. The anaemia of panters appeared to be of a microcytic nature with increase of reticulocytes: panters consumed more water, but less food than normal animals and the continuance of the anaemia was due mainly to insufficient intake of nutrients. Affected animals also suffered from acidosis and polyuria, and showed a high metabolic rate due to a hyperactive thyroid-adrenal mechanism. Readers requiring details of the many biochemical and haematologic tests employed should consult the original. C. A. E. B.

* * * * *

[Experiments on the Protection of Lambs Against Tick Pyaemia. FOGGH, A. (1948.) *J. comp. Path.* **58,** 24.]

The results of various experiments may be summarised as follows:

1. There was no response to intramuscular injections of alum-precipitated staphylococcal toxoid (according to the anti-haemolysin content of the blood) in lambs below the age of 25 days; and only a proportion responded between the ages of 25 to 45 days.

2. Lambs under ten days old had an appreciable amount of antibodies due to passive immunity received from the colostrum. The antibodies were rapidly eliminated until a low level was reached within 15 days after birth. Since tick pyaemia is essentially a disease which occurs between three and five weeks of age the passive immunity conferred in the colostrum was not sufficient to protect against infection. This was shown to be true in both natural cases and where the staphylococci were introduced artificially.

3. The presence of a raised titre did not necessarily indicate immunity, but a smaller proportion of the reacting lambs than the non-reacting lambs developed pyaemia.

4. Ewes responded well to toxoid injections, especially the first and second doses. The titre dropped rapidly after the peak had been reached.

5. In lambs a considerable individual variation existed in susceptibility to infection with staphylococci.

6. It appeared that males were significantly more susceptible to tick pyaemia than females.

From the experiment it was concluded that staphylococcal toxoid administered either to the lambs or to the ewes prior to lambing, was no value in preventing the occurrence of tick pyaemia.

S. J.

* * * * *

[Complement Fixation Test to Detect Circulating Antibodies in Sheep Infected with *H. contortus* **and** *Trichostrongylus* **spp.** STEWART, D. F. (1948.) *Aust. vet. J.* **24.** 112-113.]

This article should be of interest to research workers on sheep diseases. The method of preparation of the antigens and details of the test are given, together with a note on the results obtained. It is not suggested as a method of diagnosing worm infestation.

S. J.

Questions and Answers

The submission of questions for inclusion in this column will be welcomed: they can relate to any aspect of veterinary work. For purposes of record, each question is numbered, and those submitting questions are required to furnish (not for publication) name and address.

Answers to readers' queries represent exclusively the personal opinions of the writers, and criticism of the replies will be appreciated.

All communications should be addressed to the Editor.

Use of Detector in Diagnosis of Traumatic Reticulitis

Q. CCXCVIII.—*Do you advise the use of a mine detector (portable) in the differential diagnosis of traumatic reticulitis in bovines? If so, please give reasons, and what adaption you advise, if any.*

A.—The writer has no working knowledge of a mine detector or an adapted version. The instrument used is one designed to detect metal and when used with an oscillator, to detect buried or concealed metal pipes. Therefore, when applied to cattle it does nothing more than confirm the presence of metal in the reticulum. The response varies with different metals. Ferrous metals produce a marked reaction, brass a poor one and lead almost no reaction at all. It must be noted, however, that in veterinary use no oscillator is used.

In the writer's hands the metal detector is never used as an instrument of diagnosis. It cannot be said to confirm the diagnosis. There is a tendency at the present time, due no doubt to the publicity given to the instrument, for owners of animals to ask for its use to confirm or reject the presence of metal. It may be some consolation to the operator to know that there is a metallic object in the reticulum ! It is not beyond the bounds of possibility that an intending purchaser of a valuable cow will hand over his cheque subject to the animal "passing the metal detector" amongst other tests.

The instrument is by no means indispensable, but the same might be said of an X-ray apparatus.

There are a number of conditions which to varying degree simulate traumatic reticulitis. These include—pyelonephritis, acute post-parturient metritis, intestinal obstruction, irritant poisons and pneumonia. In such conditions to negative metal in the reticulum is helpful. Should the converse be the case, then it should not be difficult to recheck the original diagnosis. One has heard of an occasion when the detector has failed to register the presence of a foreign body subsequently removed surgically. Such an incident has not been experienced by the writer. At the same time, it would appear that the sensitivity of the instrument deteriorates very gradually and the makers recommend periodic overhaul and adjustment at least once a year.

The metal detector, in capable hands, sensibly used, is a useful instrument to have as part of practice equipment.

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Swedes and Dystokia

Q. CCXCIX.—*Is it true that swedes fed to cattle and sheep during their first pregnancy result in calves and lambs of relative oversize which may be responsible for dystokia? If so, what is the explanation, and why do not other roots cause similar trouble?*

A.—There is a difficulty in answering this query specifically. It is a fact that an excess of roots during the later stages of pregnancy does sometimes result in the birth of calves and lambs which are big and "watery," are slow to suck and generally take considerably longer time to start an active independent life than normal. On the other hand, these conditions do not always occur when excessive amounts of roots have been fed, and it is regarded by some as only likely to happen when the roots have been dressed with full or heavy applications of nitrogen (as in some compound fertilisers).

Whether swedes are more liable to produce the condition than other roots is not known, but mangels are regarded by many flockmasters as being the variety of roots most likely to result in trouble.

The question asks specifically about dystokia. It would be logical to expect that primiparous females of either species mentioned, would experience dystokia more readily when giving birth to oversized offspring, than when normal sized ones are carried and, further, the large amount of bulky watery ingesta resulting from over-feeding on roots might well contribute to dystokia from lowered muscular tonus in the dam.

It is certainly sound practice to advise clients against the overfeeding of any form of roots to pregnant cows or ewes during the last third of pregnancy, whether they are primiparous or not.

"Roaring" in Cattle

Q. CCC.—*What is known about the condition of cattle which, in this practice, is referred to as "roaring"? Severe respiratory dyspnoea occurs suddenly, becoming rapidly worse if not treated. There is swelling over the laryngeal region, pressure on which increases the dyspnoea. Two cases seen became so acute that tracheotomy had to be performed in order to avoid asphyxiation. The majority of cases encountered have responded to blistering.*

A.—The most likely cause of this dyspnoea would seem to be a type of urticaria, which may itself be a reflection of an allergic state. It surprises one to read that blistering has been attempted, as this would not normally be regarded as an effective method of treatment under the circumstances. Tracheotomy seems rather the policy of an alarmist. Usually such cases recover spontaneously but the injection of 5 c.c.s of adrenalin would be worth while and might accelerate recovery.

. . . . . .

Influence of Excessive Dilution of Bull Semen

Q. CCCI.—*Is there any reason to suspect that the excessive dilution of bull semen when used for artificial insemination purposes may have an influence on the genetical characteristics of the offspring?*

A.—The dilution of semen with saline solution increases the rate of motility of the sperm but the duration of this becomes shorter as the dilution is increased. If the egg yolk buffer solution is used as the diluent, it has been shown that a dilution of 1 : 100 can be made, without unduly increasing the motility and certainly without interfering with fertility. Though the dilution factor may be important in deciding whether or not a sperm is capable of reaching the ovum, it is not known to have any influence upon the genetical characteristics of the offspring.

(See article by Rao, C. K., and Hart, J. H. (1948): "Motility of Bovine Spermatozoa," *Amer. J. vet. Res.* **9,** 256).

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Correspondence

The Dishorning of Adult Cattle

Sir,—In the "Questions and Answers" column of your issue of March 26th last, page 165, there appears a statement in reply to a query regarding the dishorning of adult cattle which should not go unchallenged. The statement has reference to the local method of anaesthesia for this operation and is as follows: "The injection is made deep into the muscle with a short stout hypodermic needle, say 12/10 by ¾, about 1¼ in. above the outer canthus of the eye in line with the centre of the base of the horn." Exactly how deeply the injection is to be made into the muscle is left to the operator to guess.

The cornual nerve which supplies the horn core comes off from the fifth cranial nerve at the back of the orbit and ascends to the horn on the temporal muscle immediately behind the lateral border of the frontal bone, becoming more superficial as it ascends until at its last inch or more below the horn it is covered only by skin and a very thin layer of the frontalis muscle. In order to block this nerve effectively the anaesthetic should be injected subcutaneously about 1 in. below the horn (or a little more in large animals) close behind the lateral border of the frontal bone which can be easily palpated as a bony ridge ascending from the orbit to the middle of the base of the horn.

At the site referred to by the writer of the reply, namely, 1¼ in. above the outer canthus of the eye, the nerve is deeply placed and is covered by the orbital fat so that the injection of the anaesthetic over the nerve at this site cannot be made with any degree of accuracy. Furthermore, it must be emphasised that the temporal muscle on which this nerve rests is covered by a thin aponeurosis and should the latter be pierced by the needle the injection will be made into the muscle in which case the anaesthetic will have little or no effect on the nerve.

There is no question that this operation can be painlessly carried out under a local anaesthetic provided the anaesthetic is injected accurately over the cornual nerve; and the fact that recently the authorities in Great Britain considered it necessary to modify the Animals Anaesthetics Act in order to permit this method of anaesthesia to be legally adopted for this operation, is sufficient evidence in this connection. The site and the technique employed in making the injection are the all-important factors in achieving success. Faulty technique has been responsible for a certain amount of disrepute regarding this method of anaesthesia and it is well to note that some of the more recent text-books on Surgery are misleading in regard to the technique described. The operator is advised to consult "Veterinary Anaesthesia," by J. G. Wright for an accurate account of the technique employed in carrying out the operation successfully.

The main disadvantage of this method of dishorning is that the animals must be caught and restrained on two occasions, first for the injection of the anaesthetic and again, after about 15 minutes, for the operation, but the catching and recatching can be very much facilitated by having the animals enclosed in as small a space as possible, and there is no loss of time if the animals are taken in batches of five or six and dealt with in the same order for the operation as for the injection.

Yours faithfully,

T. G. Browne.

Veterinary College of Ireland,
Dublin.
April 14th, 1949.

NOTES AND NEWS

Diary of Events

May 3rd.—R.C.V.S. Animal Management Examination tour, commencing with London.

May 4th.—Meeting of the North of Ireland Division, N.V.M.A., at Belfast (Queen's University), 7.15 p.m.

May 5th.—Annual Meeting of the Central Veterinary Society, at the Royal Veterinary College, N.W, 5.30 p.m.

May 7th.—Meeting of the Biochemical Society, in the Department of Biochemistry, University Museum, Oxford, 1 p.m.

May 10th.—Annual General Meeting of the National Veterinary Benevolent and Mutual Defence Society at Manchester (Midland Hotel), 3.15 p.m.

May 11th.—Meeting of Editorial Executive Committee, 36, Gordon Square, W.C.1, 2.30 p.m.

May 16th.—R.C.V.S. Pharmacology, etc., Examination (Revised Syllabus). Written, 10 to 12 noon, at appropriate Colleges.

May 16th.—Annual Meeting of the R.A.V.C. Golfing Society, at North Hants Golf Club, Fleet, 10 a.m.

May 17th.—Spring Meeting of the Eastern Counties Division, N.V.M.A., at Colchester (Red Lion Hotel), 2.15 p.m.

June 1st (Wednesday).—Annual General Meeting of the Royal College of Veterinary Surgeons.

June 1st, 2nd and 3rd.—Quarterly Meetings of Council, R.C.V.S.

June 7th and 8th.—D.V.S.M. Written Examination, Royal (Dick) Veterinary College, Edinburgh.

June 23rd and 24th.—R.C.V.S. Membership Written Examination.

Aug. 8th to 13th.—Fourteenth International Veterinary Congress, Central Hall, Westminster, and Church House, Westminster, London, S.W.1.

Aug. 12th to 15th.—Sixty-seventh Annual General Meeting and Congress, N.V.M.A., in London.

June Meetings of N.V.M.A. Council and Committees in Edinburgh

The attention of members concerned is drawn to the following programme of meetings to be held in the Royal (Dick) Veterinary College, Edinburgh, on Wednesday, Thursday and Friday, June 22nd, 23rd and 24th, in order that they may make their arrangements in good time.

June 22nd.—Organising Committee, 2 p.m.; Home Appointments Committee, 4 p.m.

June 23rd.—Veterinary State Medical Committee, 10 a.m.; General Purposes and Finance Committee, 2 p.m.

June 24th.—Parliamentary and Public Relations Committee, 10 a.m.; **Meeting of Council,** 11.30 a.m.

June 21st to 24th.—Highland Agricultural Society's Show at Dundee.

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N.V.M.A. Grassland Conference Proceedings

With last week's issue of *The Veterinary Record* we distributed to members, N.V.M.A., the proceedings of the Association's Conference on Grassland and Animal Health held at the Headquarters of the Wellcome Foundation, Euston Road, N.W.1, on October 28th and 29th, 1948, with the President, Dr. R. F. Montgomerie, in the chair.

Copies are available to non-members at **5s. 6d.** each (post free) (not 6s. 6d. as erroneously stated in last week's announcement) and to veterinary students at 2s. 6d. each (post free) on application to the General Secretary at 36, Gordon Square, London, W.C.1, to whom any member failing to receive his copy also should apply.

PERSONAL

COLONIAL VETERINARY SERVICE PROMOTIONS AND APPOINTMENTS

The following promotions are announced: Mr. F. W. Aston, M.R.C.V.S., D.V.S.M., Senior Veterinary Officer, Kenya, to be Deputy Director of Veterinary Services, Gold Coast; Mr. P. D. L. Guilbride, B.SC., M.R.C.V.S., Veterinary Officer, Jamaica, to be Senior Veterinary Officer, Jamaica; Mr. R. A. Hutchinson, B.SC., M.R.C.V.S., Veterinary Officer, Gold Coast, to be Senior Veterinary Officer, Gold Coast, and Mr. J. B. Randall, B.A., M.R.C.V.S., Veterinary Officer, Uganda, to be Deputy Director of Veterinary Services, Uganda.

APPOINTMENTS

Mr. P. Bannister, M.R.C.V.S., as Veterinary Officer, Northern Rhodesia; Mr. J. L. N. McCulloch, M.R.C.V.S., as Veterinary Officer, Gold Coast, and Mr. M. R. Woulfe, M.R.C.V.S., as Veterinary Officer, Tanganyika.

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Birth.—DOUGAL.—On April 3rd, 1949, to Claire, wife of Laurence Dougal, M.R.C.V.S., Craignish, Pittenweem, Fife, a daughter.

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Marriages.—ALLEN—TURNER.—On April 14th, 1949, C. G. Allen, M.R.C.V.S., to Joan, younger daughter of Mr. and Mrs. Victor Turner of Frinton-on-Sea.

OBERTELLI—WILCOCK.—On April 23rd, 1949, at St. Patrick's Roman Catholic Church, Morecambe, by the Rev. Father Turner—J. M. Obertelli, M.R.C.V.S., of Highfield Cottage, Morecambe, to Mary Wilcock of Fanny House Farm, Heaton-with-Oxcliffe.

* * * * *

Dr. Russell Greig's Bizonal Area Mission.—Dr. Russell Greig has recently returned from a mission to the Bizonal area of Germany where he visited the Veterinary Research and Educational Centres including the Veterinary Colleges at Hanover, Giessen and Munich.

The mission was undertaken on the invitation of the Foreign Office and was under the auspices of the Food, Agriculture and Forestry Group of the Bipartite Control (British and American Occupying Authorities).

Dr. Greig was accompanied by Dr. A. W. Greenwood, Director, Poultry Research Centre, Agricultural Research Council.

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Distribution of Restricted Products

Instances in which a firm engaged in the distribution of veterinary products to farmers had requested veterinary surgeons to sign orders for penicillin so that supply becomes legal were brought to the notice of the N.V.M.A. General Purposes Committee last week. The attention of the R.C.V.S. has been drawn to these and it was agreed that the Pharmaceutical Society be informed and asked to take appropriate action.

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Cropping of the Ears of Boxers Condemned

The Association having been invited by the Kennel Club to express its views on the practice of cropping the ears of Boxers, this matter has been considered by the Organising Committee, who forwarded the following recommendation to the Council of the Association, by whom it was accepted at its meeting on April 22nd:

"That the cropping of the ears of Boxers be strongly deprecated by the Association and that veterinary surgeons be advised against performing this operation."

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R.C.V.S. OBITUARY

STANDLEY, Harry Percy, 103, Newmarket Road, Norwich. Graduated London, March 15th, 1923. Died suddenly, April 21st, 1949; aged 47 years.

TUNNEY, Peter John; Graduated London, 1938. Died suddenly at the Dolphin Hotel, Wincanton, Somerset, April 24th, 1949; aged 31 years.

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ERADICATION OF BOVINE TUBERCULOSIS IN BRITAIN

FINANCIAL INDUCEMENT REGULATIONS CRITICISED

In a recent address to the Tuberculosis Association, at Trinity College, Cambridge, Mr. John Francis, B.SC., M.R.C.V.S., of the I.C.I. Biological Laboratories, Wimslow, Cheshire, urged reconsideration of the regulations governing the financial inducement to the farmer to eradicate tuberculosis, which were still based on the old "public health" outlook. The problem had been taken over by the Animal Health Division of the Ministry as an agricultural one, but a farmer received no financial reward for eradicating tuberculosis; he only received a reward for selling milk from tubercle-free cows if his cowshed reached certain arbitrary architectural standards. That situation was logically untenable and unjust to many individuals. There were many farmers to-day who would eradicate tuberculosis from their herds if they could obtain the "T.T. bonus." They could not obtain this because neither they nor the landlords could afford to reconstruct the cowsheds. The problem could clearly not be solved by state ownership of farms—the resources to recondition or rebuild thousands of cowsheds were just not available. "We, therefore, have the untenable position" (quotes *The Farmer's Weekly* in its summary of the address) "in which the farmers having the most unhygienic cowsheds, in which the spread of tuberculosis is most rapid, are given no encouragement to eradicate the disease."

It might seem retrograde, said Mr. Francis, to do away with any architectural standard for cowsheds, but there was much justification for the view that the farmer with poor buildings, who was willing to eradicate tuberculosis from his herd and constantly produced milk of good quality, was entitled to the same rewards as his neighbour who was fortunate enough to have buildings which reached an arbitrary architectural standard. The logical method would be to give him a greater reward and certainly not no reward at all. In the Danish scheme of tuberculosis eradication, the rewards and penalties for eradicating tuberculosis were not linked in any way with standard of the buildings.

ERADICATION AREAS: METHODS OF DEALING WITH REACTING ANIMALS

The attested herds scheme must continue in its present form, although every effort must be made to simplify the tuberculin test and the administration of the scheme. Eradication areas would obviously soon have to be established and as this occurred and the attested herd scheme progressed, new methods of dealing with reacting animals would have to be devised. In view of the present economic conditions, there could be little justification for slaughtering reacting animals and some means of supervising them, perhaps on a special farm, must be found. In the final stages of eradication, however, reactors clearly would have to be slaughtered.

The veterinarian Arthur in 1948 emphasised that it was impossible to have a perfect tuberculin test. He believed that if the present test was used as the basis of a slaughter policy too many non-tuberculous animals would be slaughtered and in any event any sudden adoption of a slaughter policy would disrupt the dairy industry and, therefore, the milk supply. Arthur suggested that a tuberculin testing survey should be carried out and the eradication areas defined. Many cows which reacted to the tuberculin test only contained minimal lesions and Arthur suggested that Government farms should be established for reactors from eradication areas. These farms could be kept under strict supervision and all the milk coming from them pasteurised. In Switzerland there was already an official scheme for the removal of infected stock from herds where eradication was taking place to other commercial herds. The process was carried out under veterinary supervision, whereas in this country the process went on through the markets without any supervision.

Touching on statistics of tuberculosis, Mr. Francis said the highest incidence in Great Britain was in the areas supplying milk to the large cities where cowmen bought in cows to maintain their "flying" herds and thus provided every opportunity for the spread of the infection. The available evidence indicated that this high incidence was due to increased exposure to infection, rather than to increased susceptibility.

Success in eradication depended on the farmer and his men thoroughly understanding a few elementary principles. When once their interest was aroused, the eradication usually caused little difficulty. Much obviously depended on the degree of isolation which could be provided on the farm, but in many parts of the country it was clearly desirable that tubercle-free herds should be created by breaking the chain of infection from old to young stock on each individual farm.

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BRITISH HORSE SOCIETY

At the first annual general meeting of the Society, Major J. G. Morrison, M.P., M.F.H., was elected President for 1949, in succession to Mr. W. J. Cumber. A proposal that a better and larger journal than the present *Horse and Pony News* should be issued, similar to *The Horse* and containing articles, was referred to the Executive Committee for action when relaxation of paper restrictions permitted.

ADDRESSES OF DISEASE-INFECTED PREMISES

The list given below indicates, first, the county in which are situated the premises on which disease has been confirmed, followed by the postal address and date of outbreak.

Sheep Scab:

Lancs.—Bows Edge Farm, Laneshaw Bridge, Colne (Apr. 20th).

Swine Fever:

Essex.—Thames Refinery, Silvertown, London, E.16. (April 25th).

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Weekly Wisdom

"Freedom can be defined as the right to do what is not inconsistent with the rights of others. . . . We need ideals, and especially the ideal of service to others. The Englishman only feels at one with his ideal when he is serving some cause which he feels to be greater than himself; our passion for voluntary associations and movements is a good example of this. . . . I believe that the basis of all our national greatness is the theme of the home and the family life. But the foundation of life in the English home must be a proper sense of religious truth."—Field-Marshal Viscount Montgomery, speaking at the St. George's Day Dinner in Paris on April 23rd, 1949.

CORRESPONDENCE

The views expressed in letters addressed to the Editor represent the personal opinions of the writer only and their publication does not imply endorsement by the N.V.M.A.

Correspondents are requested to write as briefly as possible.

R.C.V.S. COUNCIL RESIGNATION

A Personal Statement

Sir,—I think it only right that I should inform those members who voted for me when I was elected to the Council of the Royal College of Veterinary Surgeons that, at the last meeting of the Council, I tendered to the President my resignation as a member of the present Council. This does not, of course, affect my nomination in the present voting list.

For some time past, I have found myself either in direct conflict or out of sympathy with certain decisions that have been taken: the manner in which the Veterinary Surgeons Act, 1948—particularly with respect to the title of "veterinary practitioner"—was handled by the R.C.V.S. caused me grave misgivings; more recently, certain decisions relating to unprofessional conduct have made me feel that I cannot conscientiously remain a member of the present body which, owing to the action taken by certain of its members, fails in my opinion in its duty to the profession.

With the creation of the Supplementary Register, an ever-increasing responsibility will devolve upon the Council, R.C.V.S., to impose and maintain a high standard of professional conduct. The inconsistencies of certain decisions of Council would be Gilbertian if less was at stake. In one case, a member's name was removed from the Register—quite rightly—for being drunk on a number of occasions while in charge of a motor car—a misdemeanour which did more harm to himself than it did to the profession or the general public. In a second case, a member—on his own confession—was found guilty of conduct disgraceful in a professional respect. This man, convicted by a civil court for receiving money under false pretences by the issue of certificates in respect of work which had never been carried out, in my opinion not only proves himself unworthy of having his name on the Register, but lowers the prestige of the Royal College and, indeed, of all professional men. Yet the motion to remove his name from the Register failed to be carried by the necessary majority.

I think that the Council's decision in this latter case will expose it to much adverse comment in view of the recent publication of their Ethical Code and, in particular, the issue of the grave warning which the President gave against members who offended in this respect. I am afraid that I find it a depressing thought that any member could find it compatible with his conscience to vote against such a motion.

I hope, Sir, that all members of the R.C.V.S. who have not already done so will exercise their privilege and record their vote at the forthcoming elections. With the addition to the Council for the first time of members who are not veterinary surgeons, it is more than ever necessary that those who represent our profession should, above all else, strive to uphold the highest standards of professional conduct.

Yours faithfully,

28, Lichfield Street, Tamworth. H. W. Steele-Bodger.
April 16th, 1949.

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PERSONNEL OF THE PROFESSION

Sir,—I share the interest of your correspondent, Mr. J. E. Johnson, in the questions asked by Professor McCunn, under the heading "Personnel of the Profession." Whilst appreciating Professor McCunn's sincere concern for the welfare of the present student body and his legitimate fears for their future employment, in my view his questionnaire appears to cover far too narrow a field. In any discussion on personnel, it is necessary first to assess the volume of work to be covered. May I therefore propound a further series of questions to be considered in conjunction with those of Professor McCunn?

(1) Are there, at present, sufficient general practitioners scattered over the country to give adequate and efficient services to the whole animal population, especially in view of the curtailment of unqualified practice?

(2) Have the present practitioners reasonable hours of leisure, or are they overworked to the point where efficiency may be impaired?

(3) Is the profession content with a position in which A.I. work, poultry work, livestock inspection, and other activities of a veterinary nature have passed out of veterinary hands?

(4) Is the profession satisfied with the progress made in disease control and eradication, and is the manpower (full- or part-time) available to the Ministry requisite to achieve the necessary acceleration?

(5) Is the profession satisfied with its present status in meat inspection, milk hygiene and public health work generally?

(6) Does the profession wish to keep the number of licencees of welfare societies to a minimum and replace them as soon as possible with veterinary surgeons?

It would appear to be futile to bewail loss of work, or to agitate for a wider scope of activity, if at the same time we adopt a policy of keeping our numbers to the minimum. May I repeat a statement which I made earlier, that our problem is not merely that of producing certain numbers of veterinary surgeons, but of employing them.

The policy of the profession should be to continue its development and progress by aiming at the widest possible sphere of service and ensuring the training of sufficient personnel to cope with all demands.

Yours faithfully,

49, Cambridge Street, L. Guy Anderson.
Aylesbury, Bucks.
April 20th, 1949.

. . . . . .

Sir,—I think some confusion of thought is hampering discussion about the numbers of veterinary surgeons required by this country. Surely the only logical way of assessing our needs is to consider the amount of animal disease and the number of people required to carry out the necessary treatment and research. This figure is not necessarily the same as the number which could find remunerative jobs under present conditions of employment.

During 1942, when as Mr. Johnson says there was considerable unemployment in the profession, I was working in the Women's Land Army on a small farm in the North. The herd whose dung I patiently shovelled was riddled with almost all the common diseases, and neither I nor any other veterinary surgeon was allowed to treat them at all, despite the fact that these largely unproductive beasts were eating valuable rations.

Soon after this some figures were published in the *Record* which showed that England had far fewer veterinary surgeons per head of livestock than most of the other countries of Western Europe. Unemployment, therefore, does not necessarily indicate a surplus of veterinary surgeons. If we cannot find jobs it is because disease is not being treated and research not carried out. These are failures of organisation determined by economic and political factors, and the problem can only be solved if tackled in the economic and political fields. Is it because we lack the courage to attempt this that we would seek to mask the true state of affairs by restricting the size of the profession to the number the community has thought fit to employ in the past?

Yours faithfully,

11, Domonic Drive, Connie M. Ford.
New Eltham,
London, S.E.9.
April 19th, 1949.

THE "OPEN" COLUMN

Sir,—Your correspondent, Mr. J. E. Johnson, in your issue of the 16th inst. is gratified to note that much discussion has been evoked on the subject of the "Open Column." One of the arguments used is that members do not read the columns of the Supplement as carefully as they might; it would appear from your correspondent's second letter in the same issue that he does not even trouble to read the *Record* itself, since he has to display publicly his ignorance of a matter already fully reviewed in your columns.

For some time I have taken great interest in the subject over which the correspondence originally started, namely the conditions of employment of assistants; considerable enquiry both direct and indirect does not appear to support the contention that there is widespread dissatisfaction among them as to their pay or conditions of employment.

From the general tone of some of the correspondence and the vulgar innuendo contained in the fourth letter of your correspondence columns of April 16th it would appear that some form of agitation is being worked up on the lines of that seen in the political and international worlds to-day.

Yours faithfully,

North Street, H. F. HEBELER.
Langport, Somerset.
April 16th, 1949.

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VETERINARY DEGREES

Sir,—Your issue dated February 26th, 1949, has just reached this part of Africa and I was very interested to read Professor Kearney's letter on the subject of the title to be conferred by universities upon their graduates in the Veterinary Faculty.

This point is at present under discussion in Nigeria, where the University College is considering the institution of a Veterinary Faculty giving instruction leading to a local degree.

It is highly desirable that the title of the degree in all universities should be uniform but whether the profession should advocate the title of Bachelor of Veterinary Medicine or Bachelor of Veterinary Science is debatable. Were the profession generally largely engaged upon the practice of the art of healing by therapeutics and surgical interference, the former would undoubtedly be preferable but to-day more and more, the members are engaged upon preventive medicine, livestock improvement by better husbandry, hygiene and increased and better production of animal products especially in the Dominions, the Colonies, and indeed in all territories where agriculture is the fundamental industry.

Under these changed conditions, the title Bachelor of Veterinary Science would be more appropriate while not deterring the ambitious and the more skilled, to acquire by merit the designation of "Doctor" on submission of a successful thesis to his Alma Mater, though personally, I would consider it more of an honour to have merited a fellowship of the Royal College of Veterinary Surgeons than a Ph.D., or D.Sc., of a University.

Yours faithfully,

Veterinary Headquarters, W. G. BEATON.
Vom, Nigeria.
April, 11th, 1949.

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JUNIOR SECTIONS OF DIVISIONS, N.V.M.A.?

Sir,—Recent correspondence in *The Veterinary Record* has shown plainly that there appears to be little or no contact between we younger members of the profession and our seniors. I think this is largely due to the fact that assistants get very little opportunity to attend the divisional meetings of the N.V.M.A., or if they do, they are too shy and overawed to take any useful part in the discussions. The senior in most practices feels, and I think rightly so, that it is his duty to attend these meetings with the result that the younger man has to stay at home to attend to urgent cases.

I have spoken to several of my contemporaries about the formation of a junior section of each division of the N.V.M.A., to which assistants and junior partners could belong. These sections would in no way be competitive to the parent division, members as they grew older would automatically pass into the senior division. They would also be an excellent training ground for the young graduate prior to his entry into the realms of serious veterinary politics. I do not think there would be any danger of the formation of an assistants' trade union; most of us are only too well aware of the fact that some day we hope to control our own practice and perhaps assistants!

Such a project as this can, of course, never be launched without the help of the senior members of the N.V.M.A., to them we would look for the provision of speakers and help in arranging meetings.

Our President, who has already done so much for the young ex-service members of the profession, will, I am sure, be only too willing to offer his help and guidance.

Yours faithfully,

Rowden Manor, R. M. WILSON.
Bath Road,
Chippenham, Wilts.
April 14th, 1949.

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DELAY IN PUBLICATION

Sir,—It is certain that the profession would like to know the causes of the delay of 16 months in the reception and publication of the Central Veterinary Society's Sub-committee report. (*Vet. Rec.*, April 9th, 1949.)

The delay between the reading of a paper before a Division and its publication in *The Veterinary Record* is from four to 13 months, with an average of eight months, as ascertained from your issues of 1949, to date.

The Divisional reports in the Supplements are subject to delays of two to ten months. It is appreciated that some delay is due to procrastination in the Divisions, not all secretaries being as punctual as Lincolnshire's, whose report is in London within 48 hours of the meeting.

Cannot something be done to introduce a note of topicality? On February 26th, 1949, we read that there is to be an important announcement in a Supplement, but that we should have to wait for it for four weeks. Perhaps the policy is to delay publication of any controversial matter until the *Record* can announce a *fait accompli*. In the special Supplement referred to, we read of cases heard by the Registration Committee as much as 20 months before! This is not publishing for a virile and progressive profession in rapidly changing times. It is hardly news enough to be called contemporary history.

Yours faithfully,

6, Passey Place, F. B. HALPIN.
Eltham, London, S.E.9.
April 8th, 1949.

[We are informed that delay in receipt for publication of the report of the Central Veterinary Society's Sub-committee was due to a misunderstanding, inasmuch as it was believed that the report had been sent forward to the N.V.M.A. from another source.

In regard to the publication of papers read to Divisions, secretaries frequently are unable to forward them with their associated discussions for several months; on receipt they are normally inserted within six weeks—a period which is relatively short under prevailing conditions. Reports of meetings of Divisions are published without fail in the succeeding quarterly Supplement unless for reasons of "make up" it is necessary to hold over those received shortly before going to press. Arrangements are in hand for the more frequent issue of the Supplement.—EDITOR.]

ADVERTISER'S ANNOUNCEMENT

New Penicillin Treatment in Bovine Mastitis

Glaxo Laboratories, Ltd., announce the introduction of Procaine Penicillin G Veterinary Cerate Glaxo, which, it is claimed, represents a very substantial advance in the treatment of bovine mastitis. The penicillin is presented in adequate doses and in a base designed to secure prolonged action with the aim of ensuring maximum bacteriological (as well as clinical) cure. More permanent control of the disease can be secured with the greatest convenience to the veterinary surgeon and minimum disturbance to the animals.

Each tube contains a single dose of 100,000 units penicillin G; this is present in the form of procaine salt, suspended in arachis oil with aluminium stearate. The procaine salt of penicillin is only slightly soluble in water, and its administration in the special cerate base provides a very gradual release of the penicillin so that the bacteriocidal action in the udder is steady and prolonged.

By administering this dose of 100,000 units of penicillin in the form of procaine penicillin in a non-irritant base the therapeutic effect in the lactating udder can now be prolonged for three days and even longer, so reducing the number of applications required.

The therapeutically effective level is maintained despite intermediate milking, and better penetration into the deep-seated lesions helps to prevent later flare-up of mastitis by self-reinfection from organisms remaining in the udder.

With Procaine Penicillin G Veterinary Cerate Glaxo, effective treatment can be given by administering only two doses at an interval of three days, thus providing effective therapy over a six-day period.

The use of Procaine Penicillin G Veterinary Cerate Glaxo is recommended in acute and chronic cases of bovine mastitis caused by susceptible streptococci (*S. agalactiae, S. dysgalactiae, S. uberis*) and in cases caused by sensitive staphylococci.

The procaine penicillin tube is similar in size to that of the company's other penicillin veterinary product and the nozzle is designed to enable it to be used for heifers as well as for cows. There are certain conditions, particularly in small animals, where veterinary surgeons are finding the cerate useful for intramuscular injection and an original hypodermic needle can be fitted to the nozzle.